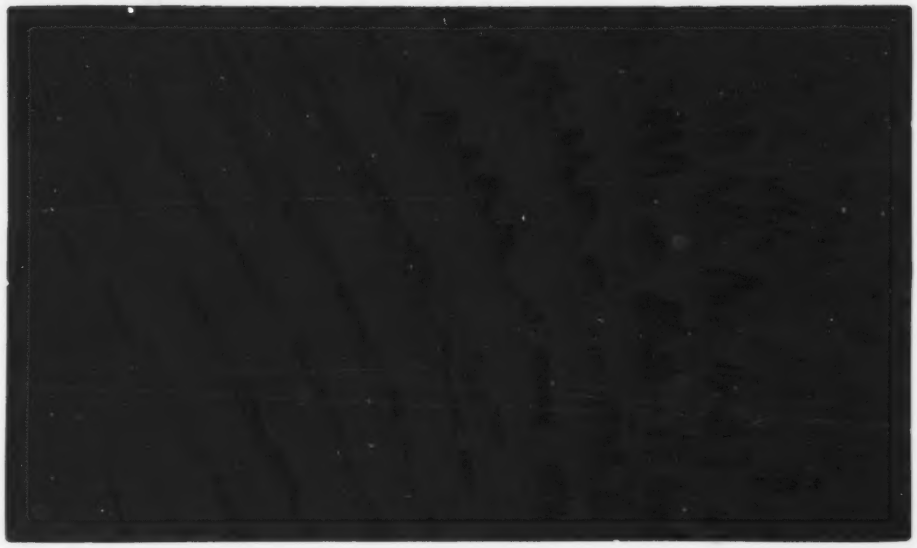
The Canadian Occupational Projection System



THE CANADIAN OCCUPATIONAL PROJECTION SYSTEM

COPS

HUMAN RESOURCE PROFILE OF THE SOLID WOOD PRODUCTS SECTOR

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In Collaboration with: The Canadian Forestry Service
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PREFACE

This document has been prepared by the staff responsible for the Canadian Occupational Projection System (COPS) at Employment and Immigration Canada in collaboration with the Canadian Forestry Service. A series of interviews between October and December, 1986, with representatives of companies, unions, and associations in the sector provided valuable comments on the information contained herein.

This report provides a profile of the solid wood products sector and presents projections of possible future courses the sector may take. Projected future occupational requirements of the industry are then tied to its anticipated performance.

The goal of the report is to provide a resource document as an aid in human resource planning over the medium term, i.e., until 1992.

We gratefully acknowledge the contribution of those who took part in the consultative process.

EXECUTIVE SUMMARY

The solid wood products sector is a large economic actor in Canada. With approximately 3,500 establishments across the country, it directly employs about 110,000 people. The sector is very diverse. Its products include lumber, shingles, plywood, wooden doors and windows, wooden boxes and pallets. Companies range from large, high production sawmills to smaller, family-owned operations. About 40% of the sector's products are exported, and a further one quarter goes to the domestic construction industry.

In order to retain and expand its position in the Canadian economy as a major producer and employer, the sector must effectively respond to the challenges it faces from changes in the world economy, technological advances, the cyclical nature of the housing industry and changes in forest management. But the diverse nature of the sector means that these issues will affect small, family-owned, non-integrated companies differently than large companies which compete in international markets.

Technological changes are having a great impact on employment levels in, and the employment profile of, the solid wood products sector. Employment levels in sawmills have dropped over the past decade, and will continue to drop, as more and more processes are automated and mechanized. Technological improvements that representatives of the solid wood products sector emphasize as important include:

- the implementation of computerized process controls;
- automatic log sawing;
- the development of engineered wood products;
- new management production systems.

There is a continuing need to invest more in new technology in order to effectively compete in oversupplied international markets. These technological advances will increase productivity, but will also translate into fewer jobs, especially for lower-skilled workers. These losses will be partially offset by jobs created and augmented in other areas such as in remanufacturing and the production of higher value-added goods.

The cyclical nature of the North American housing market poses a substantial challenge to the solid wood products sector, as one quarter of the sector's goods are purchased by the domestic construction industry, in addition to purchases by the American construction industry. The housing market is affected by the general economic climate, as well as by demographic factors. New housing demand in the Canadian market is expected to decline in the long-run, as a result of demographic factors. The effects of these demographic changes on the sector will be partially offset by the growth in Canada and elsewhere in home renovations and do-it-yourself carpentry jobs and by the opportunities presented by niche markets.

As many of the solid wood products sector's goods are exported, changes in the world economy have a great impact on its fortunes. Some of these changes include:

- a significant increase in the number of competitors in world markets, and world oversupply of solid wood products;
- slower growth in the U.S. market;
- volatile exchange rates which can make the sector's prices uncompetitive overnight;
- the recent imposition of an export tax on Canadian softwood lumber, and rising protectionism in general;
- free trade negotiations taking place between Canada and the United States.

These are all global issues in which the sector has little direct input, but which have a great impact on companies which export lumber and other solid wood products. Companies which serve the domestic market also will be affected by some of these issues, notably, the free trade negotiations. But a free trade agreement would affect a small sash door producer, who serves the domestic market, and who is already feeling pressure from foreign competition despite having a degree of tariff protection, differently than a large lumber exporter.

The state of the forest resource is also of relevance to the solid wood products sector. The major issues in forest management include: a continued supply of economically accessible trees for the forest industry, the use of forest land for recreational and other purposes, potential new employment opportunities that intensive forest management could provide, and lastly, the question of who is going to pay for the significant investment forest management requires.

The future health and employment levels of the solid wood products sector depend upon the progress and outcome of these important issues. It is certain that the sector's employment profile will continue to change. If human resource planning is to be effective in these times of changing employment structures, the methods we use to measure employment through occupational categories must keep up to and anticipate changes in occupational categories.

HUMAN RESOURCE IMPLICATIONS

Like so many sectors of the Canadian economy, the recession and rationalization of enterprises has had a major effect on employment levels in the solid wood products sector. Employment has fallen from 135,000 in 1980 to approximately 110,000 in 1985. COPS expects further drops in employment levels in the sector. By 1992, COPS predicts the solid wood products sector will employ about 103,000 people.

Representatives from the solid wood products sector agree with the COPS employment forecast and feel that it reflects the shakeout occurring in lumber markets. Representatives see a permanent shift away from lower-skilled to higher multi-skilled employees. COPS expects that the decline in basic labour positions will be the largest decline in any single occupation in the sector. Sector representatives point out that there are fewer and fewer lower-skilled occupations at the entry level, and with the job losses during the recession and subsequent low levels of rehiring, there is a surplus of workers in most trades and professions.

Future employment trends emphasize upgrading skills and retraining the existing workforce. As more and more processes are mechanized and as production controls are automated, the labour force will change so that some production workers will turn to monitoring computerized equipment and people in traditional repair trades such as electricians and mechanics will have their skills upgraded to encompass new mechanized processes and electronics. An increase in jobs in such occupations as engineering and process technicians and systems analysts will partially offset employment declines in general labouring and log hoisting, sorting and moving positions.

This document reports on the comments of the solid wood products sector on future occupational projections presented by COPS and profiles major issues that COPS, in collaboration with the Canadian Forestry Service consider to be central to successful human resource adjustment in the sector. As such, the intention is to provide an information source to assist the federal government, as well as industry, labour unions and those involved in education and training, in developing policies and programmes that will lead to effective human resources planning and adjustment.

HUMAN RESOURCE PROFILE OF THE SOLID WOOD PRODUCTS SECTOR

INTRODUCTION

The Canadian economy is changing rapidly. Daily advances in technology, the globalization of the marketplace, the possibility of a free trade agreement with the United States, the volatility of currency exchange rates, threats of protectionism, demographic changes and an oversupply of, and low prices for, our natural resources... all of these factors are changing the way Canadians live and do business. The forest products industry, as Canada's largest manufacturing industry, must understand these changes in order to adapt itself successfully to them.

The purpose of this study is to examine how these rapid changes will affect human resource requirements in the solid wood products sector so that government, industry, labour unions and those involved in education and training can develop effective human resource policies.

To help meet that requirement, Employment and Immigration Canada's statistical model, the Canadian Occupational Projection System (COPS), acquired detailed employment information at both the industrial and occupational levels, and generated projections of occupational requirements to the year 1992. These projections consist of a set of scenarios that reflect a range of possible future economic conditions.

These projections were then presented to sector representatives for their input, and their views and comments are incorporated into this report.

The first two sections of this report contain a profile of the sector and an analysis of major issues facing it, followed by a general outlook for the sector, and a section on employment and occupational information. Detailed information on the COPS study, its assumptions, and its conclusions can be found in the Appendices.

I. SECTOR DEFINITION AND PROFILE

SECTOR DEFINITION

The solid wood products sector of the forest products industry is made up of companies primarily engaged in manufacturing lumber, plywood, wooden boxes, prefabricated wooden buildings, shingles, wooden doors, windows and cabinets, and other millwork products. The sector is divided into the following major sub-sectors defined by the Standard Industrial Classification (SIC) Manual (1970):

SOLID WOOD PRODUCTS SECTOR

SIC 251 SAWMILL, PLANING MILL AND SHINGLE MILL PRODUCTS INDUSTRIES

Establishments primarily engaged in manufacturing lumber, both rough and dressed, shingles and other sawmill or planing mill products.

SIC 252 VENEER AND PLYWOOD INDUSTRIES

Establishments primarily engaged in manufacturing hardwood and softwood veneer and plywood. Plywood is classified by the type of wood on the best face, and the core may be veneer, plywood, particle board or lumber.

SIC 254 SASH, DOOR AND OTHER MILLWORK INDUSTRIES

Establishments primarily engaged in manufacturing prefabricated wooden buildings; wooden kitchen cabinets and bathroom vanities; wooden doors and windows; and other millwork products not elsewhere classified.

SIC 256 WOODEN BOX AND PALLET INDUSTRY

Establishments primarily engaged in manufacturing wooden boxes and pallets.

SIC 258 COFFIN AND CASKET INDUSTRY

Establishments primarily engaged in manufacturing coffins, caskets and other morticians' supplies.

SIC 259 OTHER WOOD INDUSTRIES

Establishments primarily engaged in treating wood products against decay; manufacturing particle and wafer board; wooden, turned and shaped forms; and other wooden products not elsewhere classified.

Solid wood products representatives generally agree with the above breakdown, but some representatives of the more traditional sawmilling operations consider SIC 256 (Wooden Box and Pallet Industry) and SIC 258 (Coffin and Casket Industry) to be outside their definition of the sector, and think that they should be excluded. Some representatives feel that developments in the use of particle board, wafer board, and specialty boards warrant a separate SIC code for reconstituted wood products. It was also noted that some overlap exists between SIC 254 (Sash, Door and other Millwork) and SIC 259 (Other Wood Industries) with respect to furniture manufacturing. A separate category for wood treating was also suggested.

NATIONAL PROFILE

The solid wood products sector plays an important role in the Canadian economy. It has about 3500 manufacturing establishments across the country (as of 1983) and directly employs about 110,000 people. The sector has by far the largest number of establishments compared to the other sectors of the forest products industry, and total value added in the sector was $4 billion as of 1983.

TABLE 1

MAJOR MARKETS FOR THE

SOLID WOOD PRODUCTS SECTOR (1971, 1976, 1981)

	Percentage Share		
SALES	1971	1976	1981
Exports	37.9	35.7	42.5
Construction	37.1	31.4	25.8
Solid Wood Products	12.1	12.5	10.3
Paper and Allied Products	6.5	7.9	9.4
Furniture and Fixture	2.5	2.1	2.5
Other[1]	3.9	10.4	9.5
TOTAL	100	100	100

1. This category includes, among other things, transportation equipment, education, health and business services, real investment and change in real inventories.

Source: Statistics Canada, The Input-Output Structure of the Canadian Economy in Constant Dollars (15-202)

About 40% of the goods of the solid wood products sector are exported, much of them to the United States. The overall export figure does not reflect the regional variations within the sector. For example, British Columbia and Quebec export more of their production than do the other provinces. Sector representatives feel that the export figure should be higher - closer to 75%.

The domestic construction industry represents the next largest market for the solid wood products sector. As shown in Table 1, the construction industry's share of purchases from the sector has declined over 10% during the past decade. This reflects the cyclical nature of the housing industry.

TABLE 2

MAJOR COSTS FOR THE

SOLID WOOD PRODUCTS SECTOR (1971, 1976, 1981)

	Percentage Share		
Cost/Source	1971	1976	1981
Logging and Forestry Services	28.2	26.1	26.7
Solid Wood Products	12.8	13.8	12.5
Electric Power	1.0	1.2	1.4
Machinery Repair	1.7	1.5	1.3
Wholesale Trade Industries	2.2	2.7	2.5
Operating Supplies	2.8	3.4	4.0
Transportation	3.0	2.5	2.6
Labour	20.5	20.0	20.0
Other[1]	27.8	28.8	29.0
TOTAL	100	100	100

1. This category includes, among other things, education, health and business services, travel, advertising and promotion, furniture and fixtures and paper and allied products.

Source: Statistics Canada, The Input-Output Structure of The Canadian Economy in Constant Dollars (1971), (15-202).

Major costs for the solid wood products sector include labour and raw materials. Sector representatives stress the continued need to implement cost savings in order to remain competitive in increasingly competitive and oversupplied markets. Some companies are currently operating below capacity. This increases unit production costs, and puts these Canadian companies at a distinct cost disadvantage in comparison to many foreign companies.

Firm size has an impact on the sector's costs. Large, integrated producers have greater control over their logging costs than do smaller, marginally profitable sawmills. The ability of large companies to invest in new cost-saving equipment and processes is also superior to that of smaller operations. The degree of mechanization, the level of use of second generation, more uniform trees, and the distance from the forest to the mill are additional

factors which affect companies' costs. Representatives note that some larger companies are also lowering costs by increasing their contracting out for some of their logging and forestry services activities.

The solid wood products sector employs about 110,000 people and creates significant spin-off employment effects in other areas of the economy. In 1979, for example, for every person employed directly in the solid wood products sector, there were 2.1 people employed elsewhere in the economy as a result of the sector's activity. This multiplier is among the highest of major Canadian industries.

TABLE 3

EMPLOYMENT STRUCTURE OF THE SOLID WOOD PRODUCTS INDUSTRY (1976, 1980, 1982, 1984, 1985)

	Employment (000)						Percentage Share			
	1976		1980		1982		1984		1985	
	#	%	#	%	#	%	#	%	#	%
251 - Sawmill, Planing and Shingle Mills	74	63	78	58	59	55	67	57	59	54
252 - Veneer & Plywood	8	7	13	10	9	8	10	8	7	6
254 - Sash, Door & Other Millwork Products	26	22	33	24	30	28	28	24	30	27
256 - Wooden Box & Pallet[1]	4	--	4	--	4	--	4	--	4	--
258 - Coffin & Casket[2]	-	--	-	--	-	--	-	--	-	--
259 - Other Wood Industries	7	6	7	5	6	7	7	6	10	9
TOTAL	119	100	135	100	107	100	118	100	110	100

1. The Wooden Box and Pallet industry represents between 2% and 3% of sector employment.
2. The Coffin and Casket industry represents less than 1% of sector employment.

Source: Canadian Occupational Projection System; Labour Force Survey, Statistics Canada

As Table 3 above shows, the sawmill, planing and shingle mill products industry remains the largest employer in the solid wood products sector, although its share of total employment in the sector has dropped from 63% in 1976 to 54% in 1985. Of all the industries in the sector, it has experienced the largest drop in employment share since 1980. The sawmill, planing and shingle mill products sub-sector, combined with the sash, door and other millwork products sub-sector, account for about 80% of the jobs in the sector.

REGIONAL PROFILE

Manufacturing establishments and employment in the solid wood products sector are concentrated in British Columbia, Quebec and Ontario. The three provinces together account for over 85% of the total number of jobs in the solid wood products sector.

TABLE 4

GEOGRAPHIC DISTRIBUTION OF EMPLOYMENT
SOLID WOOD PRODUCTS SECTOR

Province	Percentage Employment			Absolute Level			Contribution to Employment Growth or Decline ( )	
	1976	1987	1992	1976	1987	1992	1976-87	1987-92
Nfld.	0.4	0.4	0.4	500	400	400	(0.5)	---
P.E.I.	---	---	---	---	---	---	---	---
N.S.	2.4	2.6	2.6	2,800	2,800	2,700	---	(1.6)
N.B.	3.8	3.8	3.9	4,400	4,200	4,000	(1.1)	(3.2)
Que.	22.1	25.9	25.6	25,800	28,200	26,300	23.1	(30.6)
Ont.	14.6	22.5	23.8	17,000	24,500	24,500	72.1	---
Man.	1.9	1.6	1.8	2,200	1,800	1,700	(2.2)	---
Sask.	1.4	1.9	2.0	1,600	2,100	2,100	4.8	---
Alta.	5.9	4.2	4.3	6,900	4,600	4,400	(12.6)	(3.2)
B.C.	47.6	37.1	35.6	55,600	40,400	36,700	(83.5)	(61.3)
	100	100	100	116,800	109,000	102,800		

Source: Statistics Canada; Canadian Occupational Projection System

As Table 4 above shows, employment declines over the period from 1976 to 1987 were registered in about half of the provinces for which data are available. British Columbia accounted for most of the employment decline, as over 15,000 jobs were lost in the province. Over 2,000 jobs were lost in Alberta, which posted the second largest decline in employment over the period. Ontario and Quebec, however, saw increases of 7,500 and 2,400 jobs respectively.

One factor which may have contributed to these employment changes is the changing nature of the establishments themselves. In 1976, British Columbia's

average level of employment per establishment was 73 people; by 1983, it had fallen to 59. Ontario's average employment level per establishment, however, rose from 23 people to 32 people during the same time period.

TABLE 5

GEOGRAPHIC DISTRIBUTION OF OUTPUT
SOLID WOOD PRODUCTS SECTOR

Province	Percentage Output			Absolute Level ($ 1971 M)			Contribution to Output Growth or Decline ( )	
	1976	1987	1992	1976	1987	1992	1976-87	1987-92
Nfld.	0.3	0.3	0.3	3.3	3.8	3.9	(0.1)	0.2
P.E.I.	---	---	---	---	---	---	---	---
N.S.	1.8	1.0	1.0	20.2	14.6	15.9	(66.7)	1.1
N.B.	2.7	2.7	2.7	30.3	37.4	40.6	2.4	2.0
Que.	22.9	22.6	22.6	256.7	317.7	344.8	21.0	22.6
Ont.	18.9	20.4	20.4	211.9	285.5	309.9	25.3	20.4
Man.	1.9	1.3	1.3	21.3	18.5	20.0	(33.3)	1.2
Sask.	1.5	1.2	1.2	16.8	17.5	19.0	0.2	1.2
Alta.	5.9	5.1	5.1	66.1	74.0	78.1	2.0	5.1
B.C.	44.0	45.3	45.3	493.2	635.5	689.8	49.0	45.4
	100	100	100	1,121.0	1,402.3	1,522.0		

Source: Canadian Occupational Projection System

The regional nature of the solid wood products sector must be emphasized. While a few large companies produce the majority of Canada's lumber and are internationally competitive, there are a number of small companies in the sector, particularly in Quebec, Ontario and New Brunswick, which employ fewer than 50 workers, which are family-owned and non-integrated.

Regional differences also arise as a result of differing wood species. For example, one of the world's largest supply of high quality wood is located in British Columbia, allowing the province to produce and export high quality lumber, shakes and shingles. Alberta's large supplies of aspen have allowed it to increase its share in the very competitive oriented strand board market. Manitoba and Saskatchewan are growing suppliers of reconstituted panel board for central Canadian and American markets.

II MAJOR ISSUES

The solid wood products sector faces a number of challenges in Canada's rapidly changing economy. Its future performance and employment levels will depend upon how the sector responds to them. Technological changes, the cyclical nature of the housing industry and developments in the global economy are at the root of many of these challenges, while the supply of forest resources accounts for another set of problems to be addressed.

Technological changes are having substantial effects on employment levels in, and the labour force profile of, the solid wood products sector. The number of jobs in primary lumber manufacturing has been falling over the past decade, and will continue to fall as more and more processes are automated and mechanized. As Professor Les Reed of the University of British Columbia pointed out in a recent interview, fifteen years ago, a large sawmill in British Columbia, northern Ontario or Quebec would have had four or five hundred people on the payroll. Today, that same company would have one or two hundred employees. Mills that are now being built are smaller, more productive, more flexible and able to respond quickly to changing market requirements.

Technological developments in the solid wood products sector include:

- automatic log sawing;
- computerized process controls;
- new management production systems;
- log measurement by laser;
- automatic log and board sorters; and
- the development of computer-integrated manufacturing.

These developments will increase productivity in the solid wood products sector. They will lead to more jobs in some occupations, but overall job levels and the number of lower-skilled jobs in particular, will decline. As one sector representative pointed out, their Linck mill, which uses German technology in its highly-automated and flexible wood processing operation, requires one third the labour of a regular wood processing mill. Computerized

log measurement and log quality controls mean that one technician could replace up to ten wood classifiers. However, sector representatives do not expect future technological advances to translate into job losses to the extent they did during the past decade. The employment focus has shifted to value-added products, which will tend to shore up employment levels.

The solid wood products sector, more than any other sector of the forest products industry, is cyclical, as demand for construction materials such as lumber and plywood is affected by swings in the construction industry. One quarter of the sector's goods are purchased by the domestic construction industry, and a good proportion of its lumber exports are also destined for construction purposes. The housing market is very responsive to shifts in the general economic climate, as well as to demographic changes. The trend for new housing demand in Canada, for example, is expected to decline in the long-run as a result of demographic factors.

The solid wood products sector must adapt to demographic changes to ensure that it will continue to survive economic downswings which affect the construction industry. The growth in Canada and elsewhere in home renovations and do-it-yourself carpentry jobs presents an opportunity for the sector to offset the effects of the expected decline in future housing starts. Niche markets are another area expected to provide significant opportunities for future growth in the sector. Emphasis will also be laid on product improvement and innovation, in order to develop goods which will be successful in foreign markets.

Changes in the global economy will greatly affect the solid wood products sector because a large proportion of its production is exported. One of the greatest challenges the sector faces is from new foreign competitors. Many of these foreign companies have lower production costs, higher levels of plant automation and lower labour, material and transportation costs. Sector representatives point to the fact that with the coming onstream of large numbers of new producers, competition has increased dramatically, and Canada has lost its position as a preferred supplier in world markets. This in-

creased competition has also led to an oversupply of many products, notably dimension lumber.

Industry representatives recognize that if the solid wood products sector is to shore up and increase its market share, it must adjust to these new competitors. They concur that this must be done by decreasing production costs, if possible, by placing more emphasis on co-operative market intelligence, by long term strategic planning and marketing, and by the development of new market opportunities.

The sector must also continue to shift production from primary manufactured products to higher value-added products which are more market specific. Greater amounts of resources must be channelled into marketing and research and development in order to meet changing market requirements. A paper presented at a Forestry Forum in Toronto in 1986 indicated that although Canadian forest product companies have been reasonably entrepreneurial, and very "process" R & D oriented, they have not until recently had to place a high priority on investing within Canada in new manufacturing facilities to produce new products.

Volatile exchange rates and the threat of protectionism are also important to the solid wood products sector because of its fairly large number of foreign customers. The strengthening last autumn of the Canadian dollar relative to European currencies reduced the competitive position of a number of Canadian companies which had penetrated the European market. Although the dollar has recently been depreciating against European currencies, its value could rise again quickly.

Protectionism has a large impact on the ability of the solid wood products sector to sell its products abroad. While access to the American market remains relatively free, recent U.S. countervail activity, the softwood lumber deal reached with Canada whereby some softwood lumber shipments to the United States are taxed 15%, and growing American support for protectionism in general, threaten this access.

Federal-provincial discussions are currently underway to determine how the 15% export tax can be replaced by raising stumpage rates (the rate charged to the industry by the province for the right to harvest timber from Crown lands). It is expected that the tax will add to Canada's production costs, and that this increased cost will be partially absorbed by the industry and partially passed on to customers through price increases. However, its impact will depend on a number of factors such as interest rates, the ability of the companies to absorb the tax, and whether American lumber will become more cost competitive. While the current buoyant markets may minimize the effect, a downturn in the sector could result in serious problems in remaining competitive. Companies which have obtained a tax exclusion could face even more severe problems should their exclusion be revoked in the future. Those interviewed in the Atlantic provinces are particularly sensitive to the export tax. They are concerned that other provinces will divert their products east, instead of shipping to the U.S. This would lead to market saturation and loss of traditional market share for the Atlantic provinces.

The free trade negotiations which are being undertaken between Canada and the U.S. are another important issue facing the solid wood products sector. It is not clear exactly what effects such an agreement, if one were to be reached, would have. It is quite possible that Canada's lumber exports would benefit. Some of the sector's other products, however, which serve mainly the domestic market and enjoy tariff protection, would suffer if tariffs were removed without a phase-in period.

The outcome of these global issues will affect the various components of the solid wood products sector differently. For example, currency fluctuations have little impact on producers for the domestic market, but can deeply affect exporters. Large, exporting companies could benefit from a free trade agreement with the United States, and trade liberalization in general. Small companies, and ones which serve mostly the domestic market, are already feeling pressure from foreign companies which have penetrated the Canadian market despite tariffs and high transportation costs. These companies could be hurt by a free trade agreement, if they could not adapt quickly.

The solid wood products sector cannot directly influence these global issues, other than to make its concerns known to the federal government. But on another major issue area, that of forest resource management, the sector has more influence.

The solid wood products sector, along with the other sectors of the forest industry and governments, must put more thought and resources into ensuring that there will continue to be sufficient forest to meet the needs of the industry, and for recreational and other purposes. The practice of intensive forest management is the route to ensuring an economically accessible wood supply. It is made up of three parts:

- planning and administration, which includes mapping, inventory, and calculating the allowable annual cut;
- silviculture, which includes site preparation, seeding, planting, thinning and other "gardening" functions;
- protection, which encompasses disease, fire and pest control.

World demand for forest products is growing, while at the same time, the supply of softwood timber, the type that grows best in Canadian forests, is gradually tightening. However, Canada is capable of increasing the present wood harvest through the application of intensive forest management. Sweden, for example, has been practising intensive forest management for forty years, and harvests three to four times more wood per hectare.

Intensive forest management will ensure a continued supply of wood; it is expected to create new jobs and occupations and it can increase productivity through genetically improved and more plentiful trees.

The future well-being and employment levels of the solid wood products sector depend upon the progress and outcome of these important issues. It is certain that the sector's employment profile will change, as jobs lost due to such things as technological advances are offset to some degree by jobs created in

other areas. While the challenges posed by technological changes and the effects of a declining forest resource supply can be taken directly into account by human resource policy developers, those posed by changes in the global economy will be even more difficult to adjust to, and can be dealt with best by ensuring government's awareness of the sector's concerns in these areas.

III OUTLOOK FOR THE SOLID WOOD PRODUCTS SECTOR

Solid wood products representatives do not expect much growth to occur in the domestic and American markets, but think that offshore markets offer the greatest potential for market expansion. The recent boom in the housing market will probably show up in a larger share of solid wood products being sold to the construction sector in the mid-1980s. However, due to demographic factors, the long-run trend will be towards declining sales to the construction industry.

The growth opportunities provided by the upsurge in renovations and do-it-yourself jobs will partially compensate the sector as a whole for declines in the lumber and other construction materials market. Expenditures on renovations and do-it-yourself carpentry jobs accounted for 8.1% of total housing-related expenditures in the early 1970s. This figure is expected to reach about 50% by the mid-1990s. Lumber companies may also be adversely affected by the softwood lumber export tax on lumber exports to the United States, as well as by the world oversupply of its products.

Competition in the plywood industry remains strong and has resulted in some plant closures since 1982. The auto industry, the main buyer of wooden pallets, is buying fewer. Sash door and other millwork products, coffins, caskets and other wooden products industries are facing competition in the domestic market from foreign manufacturers, and unless these industries are able to adapt, it is unlikely that they will experience much growth.

The outlook for demand for the sector's products also varies from region to region. COPS expects an increased demand for high quality, British Columbia wood in the changing Japanese housing market, and for shakes and shingles which are exported to the U.S. However, product substitution could dampen these prospects. British Columbia's highly efficient lumber mills in the Interior face low prices, protectionist actions taken by the U.S., stiff competition, and rising wood costs, particularly for the high quality raw material needed to sell to the Japanese market. High wage rates have also

been an issue, and could force a choice between a plant closing down or reducing wage rates.

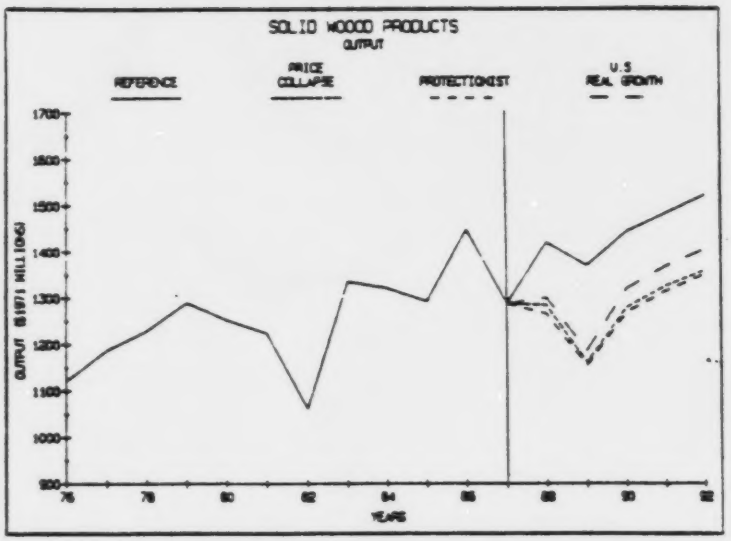
Alberta's growth in the oriented strand board market could be limited due to stiff competition. Ontario's wood products sector is very dependent upon exports to the U.S. market, and demand for its products will remain vulnerable to housing trends in the U.S. Quebec's new forestry policy will likely result in higher costs of forest management for integrated producers, which may translate into lower demand for the province's products.

In the Atlantic provinces, a balance currently exists between the logging and solid wood products sectors. Small, family-owned sawmills will not be able to maintain state-of-the-art machinery, and therefore, will be unable to compete against large, integrated companies. Moreover, the timber base is not large enough to allow for expansion of operations. While the Atlantic provinces may become an excellent area for remanufacturing operations, capital for the necessary wood drying facilities is not available at present.

This part of the report discusses output and productivity based on four forecasts or scenarios provided by the Canadian Occupational Projection System. The main assumptions underlying these scenarios are included in Appendix III.

OUTPUT

Output growth in the solid wood products sector fell sharply with the onset of the recession, but recovered rapidly in 1982-83. Since that time, as shown in the graph below, output growth has been rather erratic. COPS expects output to grow slowly at an average annual rate of just under 2% over the forecast period 1987 to 1992. A small decline will occur during 1988-89, as a result of an expected downturn in the U.S. economy.

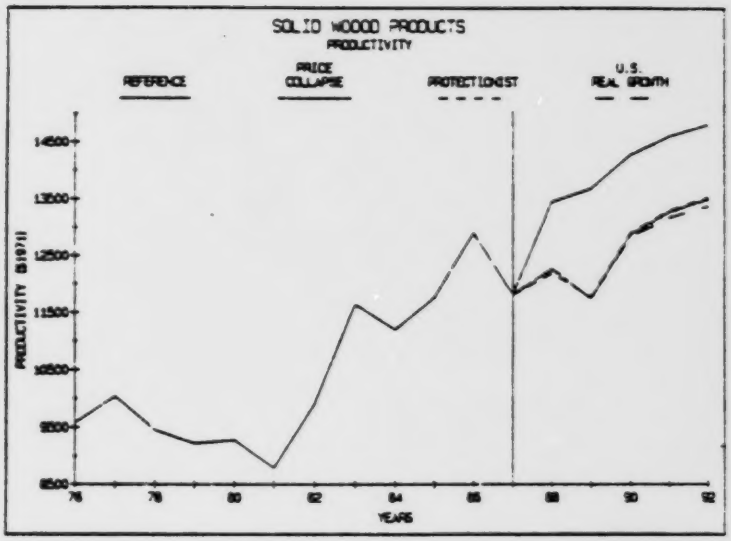


Source: Canadian Occupational Projection System

COPS expects that the largest producing province, British Columbia, will account for over 40% of the growth in output, and Quebec and Ontario will account for an additional 40% of the output growth. But Newfoundland, Nova Scotia, Manitoba and Saskatchewan will see very minimal growth in output levels over the forecast period. Solid wood products sector representatives note that output growth, primarily in the Atlantic provinces, could also be limited by annual allowable cut restrictions and reduced log yield, compounded by increasing pest and disease problems in certain areas. Future output performance will also be directly affected by product mix and whether or not markets are retained and expanded. Overall, representatives cite the reference case scenario as the most probable course for output levels over the forecast period, although some representatives were more optimistic.

PRODUCTIVITY

Productivity, (calculated as output per employee per year) declined between 1976 and 1981, but recovered sharply thereafter. Of the major producing provinces, Quebec had the highest average productivity growth of 6.5%. British Columbia posted an average 4.9% increase, close to Quebec's rate, and significantly higher than Ontario's 2% and Alberta's 2.5%.



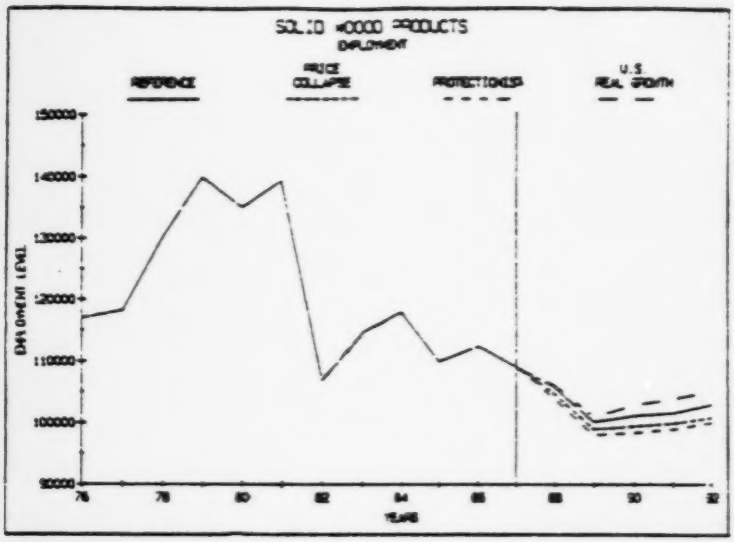
Source: Canadian Occupational Projection System

As shown in the graph above, COPS expects productivity growth to continue in the solid wood products sector. After a short drop in 1987, productivity will increase at a relatively stable rate to the end of 1992. Productivity gains will not be as spectacular as those recorded during the recovery from the recession, but will be steady. Sector representatives consider future productivity to be closely tied to developments in key markets and to increased costs due to export taxes or regional disruptions. The oversupplied dimension lumber market may face declining prices or lost production which could negatively affect productivity. The Atlantic region is very sensitive to any price collapse or protectionist actions, and if such events were to occur, could register productivity declines. In general, however, sector respondents think that if demand remains constant or increases, productivity gains will follow the reference case, as further restructuring and automation reduce costs.

IV EMPLOYMENT AND OCCUPATIONAL INFORMATION

The need to restructure large parts of the solid wood products sector in order for the sector to survive and grow in the future is having a large impact on its workforce. Many of these changes have been mentioned previously, but their effects on employment structure and levels have not been explicitly expressed.

Employment levels in the solid wood products sector have fallen considerably from the levels of the late 1970s. The sector employed over 116,000 people in 1976; this rose to over 135,000 in 1981, and has decreased to about 109,000 in 1987. COPS estimates that the number of jobs in the solid wood products sector will continue to fall from 109,000 in 1987 to 103,000 in 1992. The anticipated downturn in the American economy from 1988-89 is expected to be the principal factor behind the employment decline over these two years, and employment levels are expected to level off thereafter.



Source: Canadian Occupational Projection System

COPS projections for 1987 to 1992 indicate that employment will either stabilize or decline in all provinces. British Columbia is expected to see the largest drop, followed by Quebec. These two provinces will make up about 90% of the expected reductions in employment levels.

Sector representatives agree that workforce levels will decline over the forecast period as a result of modernization, protectionist actions, market competition, and the projected downturn in the U.S. economy in 1988-89. COPS has also generated other scenarios to project the impacts that events such as a collapse of commodity prices, or increased U.S. protectionism, could have on employment levels and sector representatives agree with the projected effects that these scenarios would have. (For the economic assumptions behind the reference and alternative scenarios, see Appendix III.)

Representatives believe that the Atlantic provinces may suffer sharper employment declines than the relatively small ones forecast for the area. Much will depend upon maintaining a balanced situation until the numerous small operations can modernize, and a solution to adjustment within the logging labour force can be found. The situation in British Columbia varies considerably between the Interior and the coast. The highly-efficient mills in the Interior are expected to survive increased competition in dimension lumber markets. The coast, however, will see lower labour force levels in dimension lumber production, but will have greater employment potential in value-added production. Job losses, then, could be offset by expansion into the remanufacturing industry, in domestic wood treating and kiln drying and through growth in offshore markets.

The employment outlook varies from one sub-sector to another. Representatives expect that employment in sawmills will continue to drop over the period to 1992. Employment increases are expected in the sash, door and other millwork products sector, as a result of increased activity in the area of home renovations. Veneer and plywood mills, like sawmills, are being modernized and may see a further reduction in employment, while the wooden box and pallet industry faces reduced demand and product substitution, which may also translate into fewer jobs. The other wood industries category is expected to

experience continuing employment growth, due to the increasing use of particle board and oriented strand board.

While both COPS and solid wood products sector representatives expect overall employment in the sector to fall over the forecast period, job levels in many individual occupations will fluctuate. The COPS study has helped industry to pinpoint the occupations which will be affected by these changes, so that the sector, as well as government, labour and training personnel can effectively plan for human resource requirements for the 1990s. There will be more jobs in some of these occupations; others will be relatively new to the sector. Certain other occupations will experience a decline in employment. Each of these situations requires human resource planning -- training for new occupations, retraining personnel in declining occupations, etc.

OCCUPATIONAL PROFILE

For the period 1987 to 1992, the COPS study forecasts employment changes for production workers (foremen, mechanics, labourers, sawyers, cabinet and wood furniture makers, log hoisters, sorters and movers, etc.) and professional, office and sales workers (mechanical engineers, systems analysts, engineering technicians, draughtsmen, bookkeepers, etc.). Overall employment levels for production workers are expected to decline, as shown in charts located in Appendix V. But most employment reductions are projected to occur in lower-skilled occupations such as general labourers. Although sector representatives find it difficult to comment on national statistics, and their responses are based largely on personal perceptions, they agree with the COPS predictions.

Representatives add that other areas subject to employment declines could be in wood processing occupations, in log hoisting, sorting and moving jobs. Materials handling systems and machines programmed to make basic decisions will have the greatest effect on occupations, especially for the lower-skilled, during the next five to ten years. Due to an expected contraction in the industry, plywood making positions also could decline. Finally, because the workforce is aging, the numbers of certain skilled workers, such as

sawyers, may decline as they are difficult to replace. In light of the increasing mechanization and automation occurring in the sector, representatives think that industrial mechanics and electronic machinists should be more in demand. Production workers able to handle computerized machine processes will also be needed. Moreover, cabinet and wood furniture makers are also felt by sector representatives to be potential growth occupations, due to the expected growth in importance of the remanufacturing industry.

COPS projections are national projections and do not reflect expected increases and decreases within occupational categories at the regional level. An overall drop in timber cutting positions, for example, is anticipated by sector representatives. Timber cutting jobs in Alberta, however, may in fact increase as a result of the expected increase in demand for oriented strand board, and as new uses for the province's large supplies of aspen are found.

For professional, office and sales workers, also shown in charts in Appendix V, COPS projects that overall employment levels will remain constant or decline slightly. Most of the declines will be seen in lower-skilled occupations, e.g., bookkeepers, accounting clerks and office support staff.

Sector representatives generally agree with this projection and note that the rationalization that has affected, and will continue to affect, production workers will next affect white collar workers as automation and computerization increase in the office. Any employment growth in office jobs will be the result of new plant openings. With respect to higher-skilled occupations, sector representatives feel that there will be more jobs for engineering technicians, especially those with computer, electronic, production process, instrument and mechanical skills. Process technicians and multi-skilled tradespeople will also be needed. Some of this demand could be met by retraining and upgrading the skills of electricians and those in mechanical trades.

The general trend confirmed by solid wood products sector representatives is the permanent shift away from a less-skilled towards a more highly-skilled workforce. Fewer, but better trained and more highly remunerated employees

ranging from mill operators to senior management, will be required. Representatives note that retraining existing staff, as well as hiring highly-skilled workers, is crucial to the successful adaptation of the solid wood products sector. This is not to say that lower-skilled production occupations will no longer exist, but in the future, there will be more jobs for highly-skilled, and multi-skilled workers.

LABOUR MARKET CONDITIONS AT THE OCCUPATIONAL LEVEL

Given these changing labour requirements, the solid wood products sector must ensure not only that it will be able to retrain existing workers, and offer early retirement, but also that it will be able to recruit a sufficient amount of the highly-qualified and skilled labour that it requires. COPS has examined the overall occupational labour market conditions within which the sector will be competing in workforce recruitment.

There are a number of factors which determine how successful the sector will be in meeting its occupational needs. Two major factors are the growth of competing industries and the competitiveness of sector wages. To assess these two factors, COPS has divided occupations (identified in Census data for 1981) into three categories according to expected difficulty of recruitment:

- occupations for which recruitment could be difficult;
- occupations for which recruitment could be somewhat difficult;
- occupations for which no difficulty in recruitment is expected.

The complete COPS assessment is located in Appendix VI. In the first occupational category, two factors are expected to lead to recruiting problems. First, major industries competing to recruit in the same occupational area are projected to grow faster than the predicted 2.5% average growth rate in output for the Canadian economy as a whole over the 1987 to 1992 period. This situation will presumably cause an increase in demand for these positions.

Second, wages of the solid wood products sector are already as high as or higher than those of these competing industries. This means that the sector will have less flexibility to increase wages further in order to attract the necessary workers. No occupations listed in Appendix VI fit into this category.

For occupations in the second category, major competing industries will grow at least as fast as the economy in general but wages offered by the solid wood products sector are lower, so the sector has wage flexibility to attract workers. Occupations in this group include industrial mechanics, carpenters, cabinet makers, log hoisters, bookkeepers, draughtsmen, industrial engineers, mechanical engineers, engineering technicians and systems analysts.

In the third grouping, the growth rate of competing industries is expected to be equal to or lower than the national average growth rate, and wages in the solid wood products sector are lower than those in competing industries. The industry faces less competition for labour and, at the same time, has some flexibility to increase wages to attract labour if necessary. One occupation falls into this category - civil engineers.

According to COPS, the solid wood products sector is likely to face some recruiting problems in all occupational categories listed in Appendix VI, because in each case, growth of at least some of the competing industries is expected to be higher than that of the economy as a whole over the forecast period. The average wages offered by the solid wood products sector in 1981 were relatively low, suggesting that the sector has not had difficulty attracting workers in the past. Looking into the future, the relatively high growth rates of competing industries suggest that the market for several key occupations may get tighter. Wage increases offered by the solid wood products industry may be necessary to ensure its labour needs are met. Most of the occupations in which recruitment difficulties could occur are higher-skilled occupations.

Sector representatives state that recruitment problems are not generally occurring at the present time, and that serious problems are not expected in

the future. However, engineering technicians, process and computer engineers and technicians, and qualified supervisory staff with knowledge of industry processes may be hard to recruit. Representatives also believe that some regional shortages may occur. The sector may have difficulties hiring cabinet makers in British Columbia, qualified millwrights in Alberta, skilled sawyers in Quebec and higher-skilled sawmill workers in general, as attrition and reduced retraining and upgrading (due to regional economic conditions) make their effects felt. Moreover, any major downturn in the solid wood products sector could mean less ability to offer competitive wages to attract needed workers or expand training and retraining programmes.

The process of change occurring in the solid wood products sector is altering the nature of the workplace. Future trends may include a shorter work week to maintain workforce levels (job sharing), early retirement programmes, retraining of older workers to help them adapt to new technologies, multi-skilling, new occupations, and a decline in jobs in some established occupations. Sector representatives stress the need for a more co-ordinated approach by employers, unions, governments and other participants in the labour adjustment process, in order to most effectively employ its most important resource: its labour force.

APPENDIX I

THE CANADIAN OCCUPATIONAL PROJECTION SYSTEM

The starting point for the COPS projection of occupational requirements to the year 1992 is a set of impact scenarios, for the economy as a whole, which presents possible alternate growth paths for macroeconomic variables - inflation, production, wage rates, productivity, etc. - that reflect views ranging from pessimistic to optimistic about future economic conditions. Factors considered include:

- -the assumed strength of the U.S. economy;
- -the degree of consumer confidence;
- -movement in energy prices;
- -shifts in population and changes in interest rates.

Sets of detailed industry output, productivity and employment projections are then generated, corresponding to the most likely scenario. Industry employment projections are finally converted into estimates of detailed occupational requirements on the basis of observed occupational structures of industries at the time of the 1981 Census. Therefore, occupational employment projections presented in this document are based on the premise of fixed occupational structures for the solid wood products sector throughout the projection period. These projections depend, then, on rather restrictive assumptions. Wherever possible, provincial analysis is included and wherever historic data are used, the latest possible numbers are employed.

Although the information COPS has produced in this way may be useful in its own right, it lacked the benefit of the advice and judgment of knowledgeable representatives of the sectors themselves. This document, then, was conceived to stimulate such input. Participants in the consultative process were asked for their views on a number of aspects of their sector. The specific questions asked are listed below, and their responses were integrated into this report.

QUESTIONS

Question I
Do you feel the present industry grouping is the most appropriate and beneficial to your data and planning needs? If not, please detail what industries should be included or excluded.

Question II

Do you agree with this profile of your industry? Do you foresee any major change in your industry structure in the medium term?

Question III

Do you feel the industry linkages section provides an accurate description of your current major markets and suppliers? Do you foresee any major change in this market structure over the medium term?

Question IV

Do you feel the background outlined is a reasonable description of the environment and major issues facing your industry? What other factors or economic influences do you think could affect the future growth of your sector?

Question V

Which scenario of the reference, pessimistic or optimistic cases best reflects your view of the future in terms of world and domestic demand for your products?

Question VI

A) Does the pattern of productivity changes projected in your sector appear reasonable in light of what you know about technological developments and changes in product mix?

B) What technologies do you feel will be most significant in the future and how significant do you expect their impact to be on total employment?

Question VII

Do you foresee any events that could alter the regional pattern projected for your sector?

Question VIII

A) Do you expect the labour force composition as presented for 1981 in Appendix V will change over the next ten years or so? Will there be entirely new occupations emerging in your sector either through new skill needs related to technologies or through combination of old skills

into one occupation (multi-skilling)? Will some occupations gradually disappear from your industry?

B) Is the sector experiencing a permanent shift away from the less skilled towards the high skilled and highly qualified? In other words, given layoffs in the early 1980s, are recall patterns likely to see a return of low-skilled workers to previous levels?

C) Please detail the reasons, (technological, demographic and/or market) for the changes you listed in section A. We are particularly interested in what technological innovations will affect occupations in the next ten years.

Question IX

According to our analysis, labour markets are getting tighter in virtually all key occupations including draughtsmen, industrial engineers, mechanical engineers, engineering technicians and systems analysts. Have you recently experienced recruitment difficulties in these or other occupations? (Please specify).

Question X

According to our analysis, future recruitment difficulties, although not severe, may occur in almost all occupations listed in Appendix VI. Do you foresee any recruitment/hiring difficulties in these or other occupations? (Please specify).

Question XI

A) Do you consider these issues important for your sector? What other issues, if any, would you consider important?

B) Is future technological change an important consideration and if so, what type of change is anticipated and what effect is it likely to have?

APPENDIX II

COPS - AN IN-DEPTH VIEW

Purpose of the Canadian Occupational Projection System

The basic purpose of COPS is to assess the extent to which occupational imbalances seem likely to prevent the economy from achieving its growth potential. This recognizes that a primary role of labour market information is to help improve output and employment growth by speeding up labour market adjustment processes, eliminating manpower "bottlenecks", and addressing the problems of excess labour supply.

COPS Economic Outlooks (Macro-Scenarios)

The outlook for labour market conditions is closely related to the broad outlook for the economy as a whole. The starting point for the approach is, therefore, a projection of economic performance in Canada over the appropriate future time period. Moreover, skill needs depend not only on the broad outlines of economic growth; they are also very sensitive to the industrial composition of that growth. Thus, the projections contain considerable detail on likely changes in the industrial composition of output and employment.

The system seeks to assess the labour market implications of potential economic growth paths. The exercise therefore begins by developing several plausible economic outlooks, using alternative assumptions about economic policy. In this way, the impact of different outlooks on the distribution of skill requirements can be tested.

Projections of Demand for Skills

Having derived consistent projections of output by industry, the next step is to translate these output projections into employment and skill projections. At present, this translation is done using the industry/occupation relationships derived from the 1981 Census. These relationships are also modified on the basis of post trend changes, judgmental inputs, and special sector studies relating to the future.

Labour Supply

Although the data in this report are essentially taken from the labour demand side of COPS, the labour supply side is an important component of the system.

Information on the labour supply consists mainly of the following:

a) 1971 and 1981 Census of Canada data on:
   - experienced labour force;
   - average age;
   - average years of schooling.

b) Unemployment Insurance Claimant data;

c) Immigration data;

d) Training Development data;

e) Attribution estimates;

f) Apprenticeship completions

APPENDIX III

COPS IMPACT SCENARIOS SUMMARY

Reference Case

Economic performance in this outlook sees U.S. growth projected to average 3% annually through the near-term (1986-90) and to moderate only slightly to 2.8% during the next five years. Tightening labour markets, an OPEC price rebound, and the lagged effects of a depreciating currency are assumed to accelerate inflation in 1988-89; as a consequence, price growth averages 3.9% through the remainder of the 1980s and accelerates to 4.9% annually over the 1991-95 period. In spite of this somewhat stronger inflation view, nominal interest rates are presumed to remain unchanged, resulting in a modest decline in U.S. real rates.

Near-term Canadian economic growth is expected to slow somewhat, particularly in the areas of residential investment and consumer demand, in the face of a reduced domestic population. The positive effects of an improved trade performance and stronger business investment in the non-primary sectors will be partially offset by a sharp deceleration in consumer demand growth - particularly for autos - over the near term. These effects yield overall economic growth of only 2.6% in 1987 and a marginal improvement in 1988 (to 2.9%) before a sharp, U.S.-induced slowdown in 1989. Led by business investment and consumer expenditure growth, the Canadian economy makes a strong recovery during the early 1990s, achieving overall annual growth of 2.9% through the 1991-95 period.

Stagnant increases in real disposable income per capita and an assumed reduction in Canada's population (arising from different demographic and net immigration assumptions) limit aggregate consumer spending to less than 2% annually through the near term. Similarly, residential investment is also considerably weaker in 1986-87, as housing starts are expected to reach 175,000 units in 1986 and fall slightly to 170,000 units in 1987. A population base which is 133,000 persons smaller in 1990 (resulting in 83,000 fewer households) and 153,000 persons smaller by 1995 (111,000 fewer households) further restrains housing starts and consumer expenditure in this outlook, in spite of reduced real interest rates.

A stronger rate of U.S. inflation yields a positive terms-of-trade effect for Canada, contributing to an improved real net export (and current account balance) position, particularly during the early 1990s. Disaggregating this kind of macroeconomic environment into its industrial effects, COPS finds that trade-sensitive producing sectors - particularly for semi-and fully processed goods - benefit more than those oriented to serving the domestic market. In this outlook, more modest primary commodity price gains dampen economic prospects somewhat in the agriculture, fishing, forestry and mining sectors. Even though an improved trade position stimulates the manufacturing sector, weaker domestic consumer demand offsets these gains, weakening the industry overall.

Overall employment growth in this outlook only matches increases in the labour force in the second half of the 1980s in spite of only modest productivity gains and virtually no change in overall labour force participation rates. As a consequence, the unemployment rate is not projected to fall below the 9% level until the early 1990s. The anticipated strengthening of economic activity during the 1990-95 period - in conjunction with an improved productivity performance which provides real income gains and boosts demand - provides employment opportunities sufficient to begin reducing the number of unemployed, though the unemployment rate remains stubbornly above 8%.

The inflation outlook in the reference case assumes modest acceleration in U.S. prices has an inflationary effect on Canadian imports, but this only marginally increases the rate of domestic inflation. With annual increases in nominal labour compensation expected to remain in the 4% to 5% range, steady interest rates, and modest increases in primary commodity prices, consumer prices in Canada are expected to increase by an average 3.5% per year through the balance of this decade and into the early 1990s.

Impact of Increased U.S. Protectionism

As one would expect, unilateral U.S. protectionist measures sharply reduce the level of real Canadian economic activity. As in the other impact cases, the trade and inflation performance is dominated by foreign exchange adjustments. The assumed significant decline in real exports creates downward pressure on

the exchange value of the Canadian dollar as the current account balance deteriorates in the first year of the impact. This effect is reinforced by an emerging weaker relative growth performance and higher inflation in Canada. The resulting depreciation is reflected in considerably higher import prices, contributing to higher inflation in general in Canada.

As inflationary pressures emerge, real disposable incomes are squeezed, leading to a sizable decline in real consumer expenditure. Further, as the pace of industrial activity slows in Canada in response to the shock, so too does the rate of business capital formation. Consequently, the volume of imports is also markedly lower in this impact case as a result of these demand effects (income effect), as well as a relative price effect which induces a certain degree of import substitution.

While the depreciation of the Canadian dollar provides a comparative trade advantage to Canadian exporters (particularly for price-sensitive commodities), the inflationary effects of the depreciation yield a moderate increase in unit labour costs, thereby limiting Canadian competitiveness and, hence, export opportunities. Overall, the real net export effect is relatively small (with the lower volume of imports offsetting reduced exports).

Impact of Stronger U.S. Real Growth

As one would expect, Canada benefits both directly and indirectly from stronger real U.S. economic growth. Led by the impact on real exports, real GNP increases 0.9% ($1.5 billion) above base case levels by 1991 and remains virtually steady thereafter. Further, an induced depreciation of the Canadian dollar dampens import demand and provides an extra boost to real exports. The resulting increase in domestic production in turn generates a need for capital expansion, causing real business investment to increase more than 1% above base case levels by 1992 before tapering off thereafter. Very modest disposable income gains yield only a small increase in real consumer expenditure in this scenario.

The assumed expansion of U.S. economic activity also generates a moderate inflationary impact in Canada. Although domestic cost pressures remain

largely in check, there emerges a strong depreciating effect on the Canadian dollar. This depreciation may seem somewhat counter-intuitive at first, for the improvement in the current account balance, which results from expanded trade, will tend to lead to an appreciation of the Canadian dollar. However, the initial pressure on the dollar is a result of a proportionately stronger U.S. growth acceleration compared to Canada. The depreciating effect of this differential in turn results in a marked increase in import prices, creating inflationary pressures in Canada. This inflationary effect is then picked up in wage formation, leading to a decline in Canadian competitiveness as labour costs increase relative to the U.S. Hence, weaker relative growth prospects and higher inflation in Canada, together with a deterioration in the terms of trade, dominate the current account balance effect and result in downward pressure on the dollar.

One characteristic of this impact which was not adjusted for is a significantly higher level of oil imports resulting from increased Canadian production requirements (induced response) and increased Canadian exports (assumed response) in the absence of increased Canadian production. For this impact, domestic production was not assumed to increase to meet demand, for it would give rise to the issue of increased oil and gas investment activity to achieve this increased production. Adjusting in the area would have clouded the foreign trade effect signals from enhanced U.S. activity.

Impact of a Commodity Price Collapse

The overall characteristic of this scenario is one of moderately stronger real growth and a significant increase in inflationary pressures. Most of this impact derives from exchange market adjustments, whereby the Canadian exchange rate depreciates 3.3% in the first year of the impact; this effect is sustained throughout the impact period, leaving the dollar over 5% below base case levels by 1995. Since this foreign exchange effect dominates the nature of this impact, it is important to recognize its source.

The initial assumed commodity price shock results in a sharp decline in Canada's current account balance position; this has a depreciating effect on the value of the Canadian dollar, and is reflected in significantly higher

import prices, and hence overall domestic inflation. These domestic price pressures are, in turn, incorporated in wage rate formation, leading to higher Canadian unit labour costs and a deterioration in Canada's competitive position with the United States. Consequently, the combination of a deteriorating current account balance, increasing domestic inflation, and a deterioration in Canada's terms of trade, offset only slightly by an improved relative growth performance, yields a sharp and sustained depreciation of the Canadian dollar throughout the impact period.

The level of real economic activity increases quite significantly in the first two years of the impact (0.7% by 1989) as real imports post a sizable decline and lower levels of consumer expenditure are offset by increased exports and business investment (both residential and non-residential). Although higher rates of inflation cause real disposable income to decline in this impact, residential investment is stimulated by the resulting decline in real interest rates. Over the longer term of the impact, real net exports remain significantly above base case levels, but continued weakness on the part of consumers and government and a fall-off in business investment serve to weaken the overall economic impact, leaving real GNP 0.35% above base case levels by 1995.

One secondary characteristic of this impact warrants noting, for the result may seem counter-intuitive. The induced depreciation of the Canadian dollar effectively raises world oil prices, as expressed in Canadian dollar terms. Consequently, this has a positive effect on the level of oil and gas investment in Canada since the industry's cash flow position is improved. Although oil and gas were not in the set of commodity prices which was subject to the exogenous price shock, one might not have expected activity in this sector to be positively affected when other primary sectors were contracting.

APPENDIX IV

OCCUPATIONAL DEFINITIONS

8230 - FOREMEN: WOOD PROCESSING OCCUPATIONS, EXCEPT PAPER PULP

This unit group includes occupations concerned with supervising and co-ordinating activities of workers engaged in sawing and preparing lumber and related materials; manufacturing plywood and producing wood conglomerates; inspecting, testing, grading and scaling lumber; and treating wood with preservatives and fire-retardants.

8584 - INDUSTRIAL, FARM AND CONSTRUCTION MACHINERY MECHANICS AND REPAIRMEN

This unit group includes occupations concerned with repairing and servicing a wide variety of industrial machinery, such as that used in printing, textile manufacturing, mining and in other production processes; material-handling and conveying equipment; farm machinery, such as combines, ploughs, mowers and milking machines; construction equipment, such as bulldozers, graders and cranes; and gasoline and diesel engines associated with industrial, farm and construction machinery. Activities include: diagnosing, disassembling, replacing parts and assemblies, reconditioning, aligning, fitting, reassembling and adjusting to specifications, using common and special hand and power tools and equipment.

8781 - CARPENTERS AND RELATED OCCUPATIONS

This unit group includes occupations concerned with preparing and erecting wooden structures and installing fixtures, using power saws, planes, braces, hammers and other carpentry tools and woodworking machines.

8238 - OCCUPATIONS IN LABOURING AND OTHER ELEMENTAL WORK: WOOD PROCESSING, EXCEPT PAPER PULP

This unit group includes occupations in labouring and other elemental work concerned with feeding, offbearing and handling activities in the processing of lumber, shingles, plywood and wood conglomerates. Activities include: feeding saws and associated machines, treating wood with preservatives and fire-retardants; stacking, piling, moving and sorting logs, lumber and

related materials; and performing other elemental duties in a sawmill, shingle mill, plywood mill or lumber yard.

8231 - SAWMILL SAWYERS AND RELATED OCCUPATIONS

This unit group includes occupations concerned with operating and tending lumber mill equipment to process logs into rough lumber, and to saw, split and plane rough lumber into stock of various sizes, such as dressed dimensional lumber, shingles and cooperage stock.

8239 - WOOD PROCESSING OCCUPATIONS, EXCEPT PAPER PULP, N.E.C.

This unit group includes occupations, not elsewhere classified, concerned with processing wood by operating or tending machines to remove bark and clean logs and poles, and to reduce logs to chips, flakes, excelsior, hog fuel or wood flour; screening wood chips; feeding saws by guiding and positioning cants, slabs or lumber on roller tables in a sawmill; and tending machines that saw pressed board or plywood sheets into panels of specified size.

8355 - PLANING, TURNING, SHAPING AND RELATED WOOD MACHINING OCCUPATIONS

This unit group includes occupations primarily concerned with setting up, operating and tending one or more woodworking machines that plane, turn, shape, mill, rout, mortise or drill wooden workpieces to make wooden parts or products in a factory or shop.

8236 - INSPECTING, TESTING AND GRADING OCCUPATIONS: WOOD PROCESSING EXCEPT PAPER PULP

This unit group includes occupations in inspecting, testing and grading work concerned with quality control activities in processing lumber and other wood products, except paper pulp.

8233 - PLYWOOD MAKING AND RELATED OCCUPATIONS

This unit group includes occupations concerned with peeling, slicing, gluing, pressing and trimming veneer sheets, and preparing core board and face sheets to produce veneer plywood panels of various thicknesses and dimensions.

8541 - CABINET AND WOOD FURNITURE MAKERS

This unit group includes occupations concerned with fabricating, assembling and repairing wooden articles, such as cabinets, furniture, store and office equipment, doors, and frames for doors, windows and picture frames from stock or previously prepared parts, and fitting and installing associated hardware, such as latches, hinges and handles. Activities include operating, manipulating and tending a variety of common and special woodworking machines, equipment and hand and power tools to assemble, fit, fasten and glue products.

7517 - LOG HOISTING, SORTING, MOVING AND RELATED OCCUPATIONS

This unit group includes occupations concerned with rigging log-yarding systems; hoisting cut logs; moving them from the site of operations; sorting logs at points of assembly; forming log booms on water; and other related activities.

7513 - TIMBER CUTTING AND RELATED OCCUPATIONS

This unit group includes occupations concerned with marking trees for cutting, preparing a wooded-area for logging operations, and felling and cutting trees.

8595 - PAINTING AND DECORATING OCCUPATIONS, EXCEPT CONSTRUCTION

This unit group includes occupations concerned with preparing surfaces for staining and painting; applying decorative and protective materials on wood, metal or similar surfaces of structures and equipment; dipping and coating; polishing and baking. Activities include: applying paint to surfaces, using brushes, rollers or hand-held spray equipment; staining furniture; operating and tending spraying machines, and performing related duties.

9318 - OCCUPATIONS IN LABOURING AND OTHER ELEMENTAL WORK, MATERIAL-HANDLING, N.E.C.

This unit group includes occupations in labouring or other elemental work relating to loading, moving, packing materials and products, signalling hoist operators and guiding loads. Activities include: placing, carrying, shovelling, packing, bagging and pouring materials; cleaning and sweeping workplaces.

9315 - MATERIAL-HANDLING EQUIPMENT OPERATORS, N.E.C.

This unit group includes occupations, not elsewhere classified, concerned with operating and tending material-handling equipment, and moving and storing goods and materials in sheds and warehouses.

PROFESSIONAL, OFFICE AND SALES

2163 - DRAUGHTSMEN

This unit group includes occupations concerned with preparing drawings from designers' sketches and specifications for such purposes as manufacture and installation of machinery and equipment, or for construction of buildings, bridges, dams, roads and other civil engineering projects; preparing topographical, political, economic, nautical and other maps and charts; drawing technical manuals dealing with assembly, installation, operation, maintenance and repair of machinery and other equipment; and copying plans and drawings.

1143 - PRODUCTION MANAGEMENT OCCUPATIONS

This unit group includes occupations concerned with carrying out managerial and administrative activities such as directing and co-ordinating production departments, divisions or other organizational units, through subordinate managers and supervisors, in an industrial, commercial, governmental or other organization.

2145 - INDUSTRIAL ENGINEERS

This unit group includes occupations concerned with the design, initiation and development of production procedures to manufacture units in large quantities of high competitive quality, while maintaining low production overhead and safe and efficient operations. Typical areas of specialization include: plant lay-out, production methods and standards, cost and quality control and industrial safety.

2147 - MECHANICAL ENGINEERS

This unit group includes occupations concerned with applied research, development and design of mechanical equipment and its manufacture; supervision of

the operation, maintenance or repair of machines that produce, transmit or consume power or energy and the tools with which machinery and equipment are made, and evaluation of installed plant and processes related to machines. Typical areas of specialization include: heating, air-conditioning, refrigeration, automotive, tool and power engineering.

2143 - CIVIL ENGINEERS

This unit group includes occupations concerned with the planning, design and supervision of the construction, maintenance and repair of buildings, bridges, dams, tunnels, ports, docks and other structures, water supply and sewage systems, transportation and other facilities for public, industrial and commercial use. Typical areas of specialization include: structural, hydraulic, environmental, irrigation and drainage, harbour, railway, highway, pipeline and tunnel engineering.

2165 - ARCHITECTURAL AND ENGINEERING TECHNOLOGISTS AND TECHNICIANS

This unit group includes occupations concerned with carrying out technological and technical functions in an engineering specialization; such as chemical, civil, electrical, industrial, mechanical, metallurgical, mining, petroleum, aeronautical and nuclear engineering, or in architecture, using a knowledge of architectural, engineering, scientific, mathematical and draughting design principles and practices.

1136 - PERSONNEL AND INDUSTRIAL RELATIONS MANAGEMENT OCCUPATIONS

This unit group includes occupations concerned with carrying out managerial and administrative activities in the field of personnel and industrial relations. Activities include: participating in establishing employee relations policies; directing the selection, training and evaluation of employees; administering employee benefit, safety and recreation programmes; developing wage and salary schedules; co-ordinating collective bargaining activities or other negotiations, and advising in the administration of labour agreements.

3313 - PRODUCT AND INTERIOR DESIGNERS

This unit group includes occupations concerned with creating designs for industrial and commercial products and interior decoration, by harmonizing aesthetic considerations with technical and other requirements. Activities include: creating designs for a wide variety of manufactured products, such as furniture and furnishings, clothing, textiles, pottery, handbags, shoes, paper securities, and packaging containers; designing interior decorations and planning furnishing of homes, public buildings and other places; setting up advertising displays; designing and laying-out stained-glass windows, and designing sets for stage, motion picture and television productions.

2183 - SYSTEMS ANALYSTS, COMPUTER PROGRAMMERS AND RELATED OCCUPATIONS

This unit group includes occupations concerned with planning, implementing and controlling electronic data-processing services and the programming of computer systems. Typical areas of specialization include: analysis of computer systems, and providing advice on availability and use of electronic data-processing resources, capabilities and technological development.

2139 - OCCUPATIONS IN LIFE SCIENCES, N.E.C.

This unit group includes occupations, not elsewhere classified, concerned with research in the life sciences; and with other life sciences activities such as studying, developing and controlling forest lands and resources; and conducting displays and lectures on historical, natural and scientific features of public parks.

4131 - BOOKKEEPERS AND ACCOUNTING CLERKS

This unit group includes occupations concerned with computing, classifying and recording data to keep sets of financial records; verifying accuracy of records related to payments, receipts and other transactions; posting entries in ledgers; balancing books and compiling reports.

6191 - JANITORS, CHARWORKERS AND CLEANERS

This unit group includes occupations concerned with cleaning building interiors, furnishings, and equipment; washing windows; and performing minor painting, plumbing and carpentry duties.

4111 - SECRETARIES AND STENOGRAPHERS

This unit group includes occupations concerned with taking dictation by shorthand writing, transcribing data by typewriter from shorthand notes or dictating machine, making appointments, answering telephone calls and performing general office duties.

4153 - SHIPPING AND RECEIVING CLERKS

This unit group includes occupations concerned with assembling, packing, addressing, stamping, loading and shipping goods; and receiving, unpacking, sorting, verifying and recording incoming goods.

1175 - PURCHASING OFFICERS AND BUYERS, EXCEPT WHOLESALE AND RETAIL TRADE

This unit group includes occupations concerned with buying goods, materials, or business services, for internal use or for further processing in governmental, industrial, business and other institutions, where the items purchased are not for resale. Activities include; establishing requirements of the organization; developing and interpreting specifications for goods or materials; studying technical publications, documents and advertising material; interviewing suppliers or inviting tenders; conducting special buying missions and negotiating for prices; establishing delivery schedules and performing other functions directly related to purchasing.

APPENDIX V

OCCUPATIONAL PROFILE - SOLID WOOD PRODUCTS SECTOR

To assist sectors in forecasting their future skill needs, COPS generates projections of employment at the detailed occupational level. Because detailed occupational data are not collected on a regular, annual basis, the approach taken assumes that the individual sector's 1981 skill mix will not change for the rest of the decade, which may or may not be valid. In order to identify how that skill mix might in fact evolve in the next ten years or so in the paper and allied products sector, respondents were asked to pinpoint those occupations whose relative importance would change, as well as the direction and extent of that change. In addition, respondents were asked what factors, whether technological, economic or demographic, would be behind this expected change.

In presenting the occupation material, COPS grouped the six major sub-sectors of the solid wood products sector. In the following table, the most important occupations are shown in terms of labour force share, categorized into two groups: production workers and professional, office and sales workers. In the body of the table are noted for each occupation, the 1971 and 1981 changes in occupational mix as well as the 1985 and projected 1992 employment levels. The growth shown is net growth. Specifically, the figures do not take into account replacement demand for workers who leave because of retirement, industrial and occupational mobility and other such factors.

SOLID WOOD PRODUCTS SECTOR
PRODUCTION WORKERS

CODE		Labour Force Composition 1971 (%)	1981	Projected Employment 1985 ('000)	1992	Change
PRODUCTION WORKERS						
High Skilled						
8230	Foremen	3.60	3.28	3.8	3.5	-0.3
8584	Industrial, Farm and Construction Machinery Mechanics & Repairmen	3.21	4.01	4.4	4.2	-0.2
8781	Carpenters	2.97	2.73	3.0	2.8	-0.2
SUBTOTAL		9.78	10.02	11.2	10.5	-0.7
Semi and Unskilled						
8238	Occupations in Labouring & Other Elemental Work	10.08	9.74	10.9	10.2	-0.7
8231	Sawmill Sawyers	7.35	6.58	7.0	6.6	-0.4
8239	Wood Processing Occupations	4.26	5.01	5.6	5.2	-0.4
8355	Planing, Turning, Shaping & Related Wood Machinery Occupations	3.63	2.01	2.2	2.1	-0.1
8236	Inspecting, Testing, Grading and Sampling	3.13	3.10	3.5	3.3	-0.2
8233	Plywood Making	2.46	1.95	2.2	2.0	-0.2
8541	Cabinet and Wood Furniture Makers	2.16	4.88	5.3	4.9	-0.4
7517	Log Hoisting, Sorting, & Moving	1.64	1.39	1.5	1.4	-0.1
7513	Timber Cutting	1.52	1.17	1.7	1.6	-0.1
8595	Painting and Decorating	0.25	0.53	0.6	0.6	0.0
9318	Labour - Mat Handling	0.05	4.09	4.6	4.3	-0.3
9315	Material Handling	0.03	3.04	3.4	3.1	-0.3
SUBTOTAL		36.56	43.49	48.5	45.3	-3.2

Source: Canadian Occupational Projection System; Statistics Canada, 1971 and 1981 Census of Canada

SOLID WOOD PRODUCTS SECTOR
PROFESSIONAL, OFFICE AND SALES WORKERS

CODE		Labour Force Composition 1971 (%)	1981	Projected Employment 1985 ('000)	1992	Change
PROFESSIONAL, OFFICE & SALES WORKERS						
High Skilled						
2163	Draughtsmen	0.21	0.20	0.2	0.2	0.0
1143	Production Management	0.18	1.50	1.7	1.6	-0.1
2145	Industrial Engineers	0.12	0.13	0.1	0.1	0.0
2147	Mechanical Engineers	0.09	0.07	0.1	0.1	0.0
2143	Civil Engineers	0.07	0.14	0.1	0.1	0.0
2165	Engineering Technicians	0.04	0.13	0.1	0.1	0.0
1136	Personnel Management Occs.	0.04	0.18	0.2	0.2	0.0
3313	Designers	0.04	0.08	0.1	0.1	0.0
2183	Systems Analysts	0.03	0.14	0.2	0.2	0.0
2139	Life Sciences Occs, N.E.C.	0.00	0.01	0.1	0.1	0.0
	SUBTOTAL	0.82	2.58	2.9	2.8	-0.1
Semi and Unskilled						
4131	Bookkeepers & Accounting Clerks	1.63	2.31	2.5	2.4	-0.1
6191	Janitors, Charworkers & Cleaners	1.50	1.49	1.7	1.6	-0.1
4111	Secretaries and Stenographers	1.01	1.07	1.2	1.1	-0.1
4153	Shipping & Receiving Clerks	0.66	0.85	0.9	0.9	0.0
1175	Purchasing Officers	0.25	0.21	0.2	0.2	0.0
Subtotal		5.05	5.93	6.5	6.4	-0.3
SUBTOTAL		52.21	62.02	69.1	64.8	-4.3
Other Occupations		47.79	37.98	40.9	38.1	-2.8
TOTAL OCCUPATIONS		100	100	110.0	102.9	-7.1

Source: Canadian Occupational Projection System; Statistics Canada, 1971 and 1981 Census of Canada.

APPENDIX VI

INDUSTRY AND WAGE PROFILE - SOLID WOOD PRODUCTS SECTOR

Occupational Labour Market Conditions

One of the main concerns of industry is the possibility of recruitment problems, especially for highly qualified and highly skilled labour. This section examines the overall occupational labour market conditions within which the solid wood products sector will be competing in the recruitment of its workers.

Current Supply and Demand Indicators

In a couple of occupations listed below, high levels of unemployment existed over the 1982 to 1984 period. Particularly in the low-skilled category, a significant jump in unemployment occurred from 1981 to 1982 and remained relatively high thereafter. The UIC-to-stock ratio* for log hoisting occupations averaged 57%. Relatively lower unemployment levels over the 1982 to 1984 period occurred in the higher skilled occupations such as industrial engineers (4%), mechanical engineers (6%) and systems analysts (5%).

As time passed between 1982 and 1984, the UIC-to-stock ratio rose in almost all low-skilled occupations so that the rate in 1984 was higher than the previous three years. Alternatively, for the higher skilled workers, in all but one instance, the rate had fallen from 1983 to 1984. This suggested a greater degree of excess supply existed in the low-skilled compared to high skilled labour categories. These high-skilled occupations include draughtsmen, industrial engineers, mechanical engineers, civil engineers, engineering technicians and systems analysts.

This observation is reconfirmed by National Job Bank (NJB)** statistics. In-

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* UIC-to-stock ratio is the ratio of the number of unemployment insurance claimants with a given occupation to the total number of people in that occupation.

** The National Job Bank is a registry of long term vacancies at Canada Employment and Immigration Centres. The statistics include jobs available to both Canadian and foreign workers.

the high-skilled occupational category, NJB numbers fell significantly from 1982 to 1983, reflecting the large pool of unemployed willing to fill positions. However, as the high-skilled market tightened from 1983 to 1894, the NJB numbers increased in every case. Alternatively, in the low-skilled labour category, there was little change in the NJB numbers from one year to the next, suggesting the unemployment rates have been and remain high.

INDUSTRY AND WAGE PROFILE BY OCCUPATION (1981)

SOC	Occupation	Employer*	Percentage of Total Employment	Annual Average Real Growth	Annual Average Wage**
CATEGORY TWO					
8584	Industrial Mechanics	Trade	14.7	3.1	$21,500
		Metal Mining	8.1	4.2	$16,000
		Construction	7.8	3.7	$21,500
		Solid Wood Products	5.3	0.7	$20,500
		Other	64.1		
		Total	100.0		
8781	Carpenters	Construction	71.1	3.7	$13,000
		Solid Wood Products	3.2	0.7	$12,000
		Other	25.7		
		Total	100.0		
8541	Cabinet Makers	Furniture	49.0	3.1	$16,000
		Trade	8.8	3.1	$ 9,500
		Solid Wood Products	8.3	0.7	$11,500
		Construction	7.1	3.7	$12,500
		Other	26.8		
		Total	100.0		
7517	Log Hoisters	Forestry	71.8	1.3	$17,000
		Solid Wood Products	16.2	0.7	$18,000
		Other	12.0		
		Total	100.0		

- continued -

SOC	Occupation	Employer*	Percentage of Total Employment (1981)	Annual Average Real Growth (1985-92)	Annual Average Wage** (1981)
4131	Bookkeepers	Trade	24.7	3.1	$10,500
		Finance	12.3	1.9	$11,000
		Business Services	8.7	1.9	$11,000
		Public Admin.	8.2	2.6	$13,000
		Solid Wood Products	6.0	0.7	$11,500
		Other	40.1		
		Total	100.0		
2163	Draughtsmen	Business Services	37.6	1.9	$14,000
		Public Admin.	11.8	2.6	$16,500
		Construction	5.8	3.7	$15,000
		Solid Wood Products	0.7	0.7	$14,000
		Other	44.1		
		Total	100.0		
2145	Industrial Engineers	Business Services	10.2	1.9	$27,000
		Electrical Products	10.0	4.9	$22,500
		Machinery	8.1	4.3	$24,500
		Public Admin.	6.7	2.6	$25,500
		Solid Wood Products	1.0	0.7	$24,500
		Other	64.0		
		Total	100.0		
2147	Mechanical Engineers	Business Services	24.2	1.9	$29,500
		Machinery	11.1	4.3	$25,500
		Public Admin.	6.0	2.6	$26,500
		Solid Wood Products	0.5	0.7	$27,000
		Other	58.2		
		Total	100.0		
2165	Engineering Technicians	Business Services	13.6	1.9	$17,000
		Public Admin.	10.9	2.6	$18,500
		Elec. Products	10.4	4.9	$16,000
		Solid Wood Products	0.3	0.7	$17,000
		Other	64.8		
		Total	100.0		

- continued -

SOC	Occupation	Employer*	Percentage of Total Employment (1981)	Annual Average Real Growth (1985-92)	Annual Average Wage** (1981)
2183	Systems Analysts	Business Services	22.1	1.9	$20,000
		Public Admin.	16.3	2.6	$20,500
		Solid Wood Products	0.3	0.7	$16,500
		Other	61.3		
		Total	100.0		
CATEGORY THREE					
2143	Civil Engineers	Business Services	10.2	1.9	$29,500
		Public Admin.	6.1	2.6	$27,500
		Solid Wood Products	1.0	0.7	$28,500
		Other	82.7		
		Total	100.0		

* Where the 'other' category is large, this indicates that the occupation is spread over a large number of industries.

** Includes both full-time and part-time workers.

Source: Canadian Occupational Projection System; Statistics Canada, 1981 Census of Canada.

APPENDIX VII

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